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Notice of Allowability

Application No.

10/696,669

Examiner

Victor J. Taylor

Applicant(s)

WHITTAKER ET AL.

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8 September 2005.
2. ☒ The allowed claim(s) is/are 1-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

Drawings

1. The drawings were received on 22 September 2005. These drawings are approved.

Response to Arguments

2. Applicant's arguments see the corrected drawing, filed 22 September 2005, with respect to the corrected drawing have been fully considered and are persuasive. The objection to the drawing of 5 April 2005 is moot and has been withdrawn.
3. Applicant's arguments see the argument and amendment filed 8 September 2005 with respect to the claim objection to claims 14 and 16-20 and the void mapping robot argument have been fully considered and are persuasive. The objection to claims 14 and claims 16-20 of 8 September 2005 is moot and has been withdrawn.
4. Applicant's arguments see the argument and amendment filed 8 September 2005 with respect to the amendments in the independent claims and the arguments for the autonomous void mapping robot with the differences in the cited art of record have been fully considered and are persuasive. The 102 (e) rejection of 8 September 2005 is moot and has been withdrawn.

Allowable Subject Matter

5. Claims 1-21 are allowed.
6. The following is a statement of reasons for the indication of allowable subject matter:

Regards to claim 1, the applicants argument of record for the system of the void mapping robot autonomous vehicle with the autonomous ability to move the robot and adjust a route in the subterranean void without human interaction as argued in the response with the steps for capturing the local range data and incorporating the captured local range data into a full data map of the interior surface of the subterranean void with steps for moving the void mapping robot to a second position within the subterranean void independent of outside control in the autonomous mode with the route based on the analysis of the full mapped data obtained from the interior surfaces of the subterranean void by the robot with the independent functions of egress and ingress into the void that are independent of the teleportation systems presently used in the art to produce a detailed interior map of an inter void is not found in the cited art of record.

Therefore, Independent claim 1, a method for mapping the interior surface of a subterranean void with the steps for "inserting an autonomous void mapping robot at least partially into an interior portion of the subterranean void "...[and combined] with the steps for the "capturing local range data describing the interior surface of the subterranean void at a position proximate to said void mapping robot"...[and in combination with the steps used for] "incorporating said captured local range data into a full data map of the interior surface of said subterranean void"...[and/or] in combination with the explicit steps for "moving said void mapping robot to a second local position within the subterranean void, the route to said second position calculated by the autonomous void mappings robot based on an analysis of the full map data including

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the captured local range data"...[and/or] in combination with the explicit steps used to "capturing second local range data describing the interior surface of the subterranean void at a position proximate to said void mapping robot"...[and] "incorporating said captured second local range data into the full data map" in order to model and display the rotational data is not found in the cited art of record.

Claims 2-13 and 21 are variously dependent on the allowed independent claim 1 and are allowed at least for the reasons cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Regards to claim 14, the applicants argument of record for a model method for mapping the interior surface of a void and displaying the full data map of the interior surface of the subterranean void using steps for moving the void mapping robot to a second position within the subterranean void independent of outside control in the autonomous mode with the route based on the analysis of the full mapped data obtained from the interior surfaces of the subterranean void by the robot with the independent functions of egress and ingress into the void that are independent of the teleportation systems presently used in the art to produce a detailed interior map of an inter void is not found in the cited art of record.

Therefore, Independent claim 14, a modeling method for mapping the interior surfaces of a void using the modeling steps for "storing existing data about the interior surfaces of the void"...[and] with "ingression an autonomous void mapping robot into the void"...[and combined] with the steps for "determining a mode of exploration based on

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the existing data"...[and in combination with the steps used for] "determining an initial mobility plan based on said existing data and the mode of exploration"...[and/or] in combination with the explicit steps for "modeling at least a local area of the interior surfaces of the void proximate the void mapping robot using two dimensional range finding scans"...[and/or] in combination with the explicit steps used to "utilizing additional sensors to gather environmental information about the interior of the void not related to navigation"...[and with] "autonomously updating said mobility plan on board the void mapping robot based on the model of said local area"...[and] with "egressing the void mapping robot out of said void" in order to model and map the interior of a void is not found in the cited art of record.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Regards to claim 15, the applicants argument of record for the system of a robot for mapping the interior surface of a void with means for moving and means for range data collection with calculating modeling means to map the subterranean void independent of outside control. And operated in the autonomous mode with the route based on the analysis of the full mapped data obtained from the interior surfaces of the subterranean void by the robot with the independent functions of egress and ingress into the void that are independent of the teleportation systems presently used in the art to produce a detailed interior map of an inter void is not found in the cited art of record.

Therefore, Independent claim 15, with the system a robot for mapping the internal surface of a void with "means for moving the robot within the void"...[and

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combined] with the steps for the "range data collection means for collecting local mapping data about the void by determining the distance from a point in the internal surface of the void to the robot"...[and] in combination with the "means for incorporating the local mapping data into an overall void map on board the robot"...[and] in combination with the explicit steps for "means on board said robot for utilizing the local mapping data to calculate movement of the robot through the void by the means for moving the robot" in order to model and display the mapping data is not found in the cited art of record.

Claims 16-20 are variously dependent on the allowed independent claim 1 and are allowed at least for the reasons cited above.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

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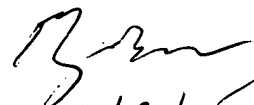
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VJ Taylor


October 28, 2005.

BRYAN BUI
PRIMARY EXAMINER


10/31/05